CLAIMS

What is claimed is:

1. A method of disposing a conductive structure on at least one contact pad on an active surface of a semiconductor device substrate, comprising:

disposing a layer of material over the substrate;

altering a surface of said layer of material to impart said layer with a thickness corresponding approximately to a desired height of the conductive structure;

forming an aperture through said layer to expose at least a portion of the at least one contact pad;

disposing a quantity of conductive material on said layer of material and permitting said conductive material to substantially fill said aperture;

bonding said conductive material within said aperture to the at least one contact pad to form a conductive structure of substantially said desired height; and

at least partially exposing a periphery of the conductive structure through said layer.

2. The method of claim 1, wherein said disposing said quantity of conductive material over said layer comprises disposing a quantity of substantially molten conductive material on said layer.

3. The method of claim 2, wherein said bonding is effected as said quantity of substantially molten conductive material solidifies in said at least one aperture.

4. The method of claim 1, wherein said disposing said layer comprises adhering a film to a surface of the substrate.

5. The method of claim 1, wherein said disposing said layer comprises fabricating said layer on the substrate from material comprising polymer, silicon oxide, or silicon nitride.

6. The method of claim 1, wherein said disposing said layer comprises placing a quantity of said polymeric material on the semiconductor device and wherein said altering said thickness comprises spreading said material to a substantially consistent thickness over at least a portion of a surface of the substrate.

7. The method of claim 1, wherein said forming said aperture occurs prior to said disposing said layer over the substrate.

8. The method of claim 1, wherein said forming said aperture comprises etching said aperture through said layer.

9. The method of claim 8, wherein said etching occurs following said disposing said layer over the substrate.

10. The method of claim 1, wherein said exposing at least a portion of said periphery of the conductive structure comprises substantially removing said layer from the substrate.

11. The method of claim 10, wherein said removing comprises etching said layer.

12. The method of claim 10, wherein said removing comprises peeling said layer away from the substrate.

13. The method of claim 1, wherein said at least partially exposing said periphery of the conductive structure comprises reducing said thickness of said layer.

14. The method of claim 13, wherein said reducing said thickness comprises at least partially etching said layer.

15. The method of claim 13, wherein said reducing said thickness comprises shrinking said layer.

16. The method of claim 15, wherein said shrinking comprises exposing said polymeric material to radiation, exposing said material to a shrinking agent, or exposing said polymeric material to a plasma.

17. The method of claim 1, wherein said at least partially exposing said periphery comprises exposing said material to a solvent.

18. The method of claim 1, wherein said disposing said quantity of conductive material comprises immersing a surface of the substrate having said layer disposed thereon within a quantity of molten conductive material.

19. The method of claim 1, wherein said disposing said quantity of conductive material comprises disposing solder on said layer.

20. The method of claim 1, wherein said disposing said quantity of conductive material comprises disposing conductive elastomer on said layer.

21. The method of claim 1, wherein said forming said aperture comprises exposing a portion of said contact pad located within a periphery thereof.

22. A method of forming a solder mask, comprising:

disposing a non-metallic solder mask material onto an active surface of a substrate;

forming a layer of said solder mask material having a substantially consistent thickness on the active surface of said substrate;

altering a surface of said layer to impart said layer with a thickness corresponding to a desired conductive structure height; and

forming at least one aperture through said layer in a location corresponding to at least one contact pad location of said substrate to expose said at least one contact pad through said solder mask.

23. The method of claim 22, wherein said disposing said solder mask material comprises fabricating a layer comprising a silicon oxide.

24. The method of claim 23, wherein said disposing and said forming said layer are effected substantially simultaneously.

25. The method of claim 23, wherein said altering said thickness comprises planarizing said layer.

26. The method of claim 25, wherein said planarizing comprises chemical-mechanical polishing.

27. The method of claim 22, wherein said disposing said solder mask material comprises disposing a polymeric material on said active surface.

28. The method of claim 27, wherein said forming said layer comprises softening or melting said polymeric material.

29. The method of claim 28, wherein said altering said thickness comprises spinning said polymeric material over said active surface.

30. The method of claim 28, wherein said altering said thickness comprises spreading said polymeric material across said active surface.

31. The method of claim 22, wherein said forming said aperture comprises etching a region of said layer.

32. The method of claim 22, wherein said solder mask material comprises a photosensitive polymeric material and wherein said forming said aperture comprises exposing a region of said photosensitive polymeric material disposed over said at least one contact pad to form said at least one aperture through said layer.

33. A pre-formed solder mask, comprising:

a layer of non-metallic solder mask material having a substantially uniform thickness; and

at least one open aperture formed through said layer and located correspondingly to a contact pad location of a substrate upon which the pre-formed solder mask is to be disposed.

34. The pre-formed solder mask of claim 33, wherein said aperture is configured to be positioned over and to expose a non-peripheral region of said contact pad.

35. The pre-formed solder mask of claim 33, wherein said substantially uniform thickness of said layer substantially corresponds to a desired height of a conductive structure to be formed on said contact pad.

36. The pre-formed solder mask of claim 33, wherein said solder mask material comprises a polymer.

37. The pre-formed solder mask of claim 33, wherein said solder mask material shrinks or degrades upon exposure to radiation, a plasma, or a shrinking agent.

38. A method of exposing a periphery of a conductive structure on a semiconductor device, comprising reducing a thickness of a solder mask disposed around said periphery.

39. The method of claim 38, wherein said reducing said thickness comprises irradiating said solder mask, exposing said solder mask to a plasma, or exposing said solder mask to a shrinking agent.

40. The method of claim 38, wherein said reducing said thickness comprises selectively etching a material of said solder mask with respect to the conductive structure.